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ABSTRACT

First in a continuing series of reports on trends in marketing and publication of software for literacy education, a study explored the development of a database to track the trends and reported on trends seen in 1995. The final version of the 1995 database consisted of 1011 software titles, 165 of which had been published in 1995 and 846 published in previous years. Software were classified into 6 major categories. Results indicated that (1) an enormous amount of software is available for use by teachers of reading and literacy; (2) drill and practice software was the largest category of software available; (3) the publication rate of software for instruction does not appear to be slowing; and (4) in 1995, the number of new titles in the 3 largest categories (drill and practice, electronic books, and applications) was about the same. Further analyses will provide more detailed examinations of other aspects of the topic, developed from the database. (Contains 1 table of data and 7 references. A 23-item list of software publishers and distributors is attached.) (RS)

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Software Classifications: Trends in Literacy Software Publication and Marketing

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Description of the Project

The purpose of this paper is to provide information found in the first year of a project designed to track trends in publication of commercial software for literacy education. The project had two main components, the database and monitoring of the field.

a) The database: This collection of information was designed to provide a numerical sampling of trends in commercial software publication in literacy education. A variety of publishers were identified as having impact upon use of computers in the classroom for reading and literacy purposes, as determined by distribution and prominence of their software. Only software that had a dominant theme that fit the typical reading/literacy curriculum was included in the database.

This policy eliminated much software that has important potential literacy application, but that has a dominant theme pertinent to some other content or skill area, such as science or social studies. For example, Our Environment (Sunburst), an interactive multimedia source of information on natural resources, could be used in a literacy-rich thematic unit on ecology. It was not included in the database, since its focus is in the content area of science.

In addition, software that focused on advanced literature studies,

such as might be used in secondary English classrooms, was not included unless it had a clear skills orientation. For example, Clearvue's Women in Literature was not included in the database, while that publisher's How to Read and Understand Short Fiction was included.

One common phenomenon in the field of software publication is the regular release of updates of software. Such updates sometimes represent very minor changes, such as correction of programming errors, and are often not even publicized as updates. For example, a Version 3.1 of a particular piece of software might well be virtually indistinguishable from Version 3.0 by the typical user. In such cases, the updates were not included as new entries in the database. In other cases, however, updates provide significant changes in software content or structure. In such cases, the updates were included as new entries and were assigned a date of publication of the year in which the update occurred.

The final version of the 1995 database was completed in Winter, 1996. A total of 1011 software titles were included. Of the 1011 titles, 165 (16%) had been published in 1995 and 846 (84%) in previous years.

b) Monitoring of the field. In addition to the accumulation of numerical data for the database, the project included monitoring of major publications related to software use in education for collection of pertinent information. A wide variety of computer-related magazines and journals deal with educational topics on occasion. Many journals that

focus on literacy education deal with computer topics on occasion. In addition, the Internet is a valuable source of information on education-related topics.

Publishers Included

Assembly of the database began with identification of publishers who have played a major role in the field of reading and literacy. The first publishers to be included in the database were chosen on the basis of their importance to the field of reading/literacy education according to a variety of measures.

a) The list of software publishers with booths at the 1994 International Reading Association Convention in Toronto was as follows:

Broderbund Software

Computer Curriculum Corporation

Discis Knowledge Research, Inc.

EduQuest, an IBM Company

Grolier Educational Corporation

Hartley

HOTS/Thinking with Computers

Jostens Learning

Scholastic, Inc.

Tom Snyder Productions

b) The list of software publishers presenting in the Technology

Strand sessions at the 1994 International Reading Association Convention in Toronto was as follows:

Discis Knowledge Research

EduQuest

Weaver Instructional Systems

Tom Snyder Productions

Scholastic

American Information Services

Don Johnston, Inc.

Teacher Support Software

Silver Burdett Ginn

Davidson & Associates

c) Publishers of software distributed by high profile commercial outlets was monitored. These distributors included Kidsoft, Scholastic Software Clubs, the Edutainment Company, and Educational Resources.

Apple Computer Corporation's Internet web site (http://www.info.apple.com/education) for advertising of software created by third party publishers highlighted literacy software by a frequently changing list of publishers, including the following:

Creative Wonders

Davidson

Knowledge Adventure

The Learning Company

Broderbund

Scholastic

Virgin Sound and Vision

Disney Interactive

As the database grew, other sources of information were tapped to identify a wider variety of publishers who release relevant software. In all, 98 publishers and distributors were represented in the database by the Spring of 1996. Some had only one literacy-related title in their offerings. Others offered wide selections of software. Among the publishers with the largest number of offerings were Scholastic (182 titles), Edmark (73), Broderbund (62), Hartley (62), Davidson (40), IBM/Eduquest (35), and Sunburst (32).

Introduction

Attention to the issues related to educational use of computing is needed now more than ever, as computers become more a part of the everyday life of the classroom. Recent data from New York State, one of the leading states in funding educational technology, suggest that 72% of students and 50% of teachers now use computers regularly (New York State Public Schools, 1994). U.S. Department of Commerce (1994) figures indicate that the ratio of students per microcomputer in public schools has improved from 62.7:1 in 1984-1985 to 12.2:1 in 1992-1993, the

latest figures available.

Market statistics also indicate a rapid increase in the sales of educational software for home use. The 1993 total U.S. sales of such software, the latest figures available, was 243 million dollars. A leading operating system, Macintosh, showed a one year growth rate in home education software sales between 1992 and 1993 of 83% (U.S. Department of Commerce, 1994).

In the public schools, use of computers for literacy instruction accounts for some 13% of school computer use, just below the top-ranked categories of mathematics instruction (15%) and keyboarding instruction (14%) (U.S. Department of Commerce, 1994).

What kinds of literacy software are being published?

A variety of educational software classification schemes have been suggested. Taylor (1980), for example, described the major types of software as tutor, tool and tutee. Tutor software presents some subject material for the purpose of teaching students. This software, more frequently called computer-assisted instructional (CAI) software, is often subdivided as tutorials, which provide initial instruction on a concept or skill, and drill and practice software. Tool software can be flexibly used in a variety of subjects to carry out some useful capability, such as mathematical calculation or word processing. This software is more frequently called application software. In a "computer as tutee"

experience, the human student teaches the computer by programming it. The various forms of Logo software, for example, would lend themselves to such classroom experiences. In their text on using computers for the teaching of reading, Strickland, Feeley and Wepner (1987) followed Taylor's classification system. They included as tool software such applications as word processing, teacher utility programs that can create games and puzzles and other instructional exercises, assessment programs, and data bases. They divided the tutor category into two subcategories: Drill and practice and interactive learning, which included a wide variety of more creative applications such as a reading prediction game and a choose-your-own-ending story creation program. Under the computer as tutee category, they listed a variety of ways that language learning could be integrated with programming instruction.

Rather than classifying types of software, Blanchard, Mason and Daniel (1987) focused on uses of computers in reading. Noting that "computers were used principally for drill and practice activities with few innovations" (p. 1), they offered a variety of other potential uses of interest to literacy educators: Testing, information and instruction management, tutorial/dialogue, simulations, telecommunications and information retrieval, word processing, utilities, interactive fiction, videodisks and compact disks, speech, and programing and problem solving. Similarly, Balajthy (1986) offered a model of microcomputers and reading

which addressed uses of computers in literacy learning rather than classification of software. Major categories in the model were interaction (including simulations and adventure games), reading readiness, teacher utilities, information retrieval, content area instruction, direct instruction, solo mode instruction (similar to the computer as tutee), writing activities, diagnosis, and word games.

In the present study, software was classified into six major categories, including a multiple category indicating that the contents were varied enough to fit more than one other category. Taylor's (1980) two categories of most relevance to literacy learning, tutor and tool, were each replaced by two component categories. Tutor software was replaced by tutorial (providing initial instruction in a skill or concept, often accompanied by limited drill and practice) and drill and practice (providing repetitive practice exercises, often in game form, with varying amounts of feedback on performance) categories. Tool software was replaced by application (providing the capability to carry out tasks in flexible ways for a variety of subjects) and reference (providing a database of information) categories. The reference category was included as a separate category because of the greatly increasing use of electronic media for information storage. Finally, an electronic book category was developed as a result of the increased use of electronic textual material for reading in the past few years.

Results

The standing assumption among many literacy educators is that almost all software for reading and writing is drill and practice software. In fact, in an analysis of types of software in the database as a whole (see Table 1), that category was indeed the largest. However, well under half of the software was drill and practice, some 37% of the titles. The second and third largest categories were both quite sizable. Electronic books accounted for 26% of the titles, and applications accounted for an additional 23%. The remaining categories were much smaller. Tutorials accounted for 8% and reference for less than 1%. The multiple category included 5%.

Insert Table 1: Types of Software

The quantity of electronic books, 265 titles, represents a considerable change in types of software available for reading and literacy education since the late 1980's. Prior to the advent of CD-ROM technologies, electronic text was being researched and discussed theoretically, but few actual commercial examples were available. In 1995, CD-ROM-based electronic texts for both adults' and children's use were available in great numbers, covering broad ranges of subjects. As mentioned above, the titles listed in the database were specifically

targeted to the reading instruction and reading experiences of children, as opposed to content area study. This distinction, which is useful and well understood within the field of education, is in fact artificial. Children's development in reading is hardly limited to their experiences with recognized materials designed for reading instruction. Therefore, many of the hundreds of CD-ROM electronic books not included in this database could well be valuable tools for reading teachers desiring to arouse motivation in their students, or desiring to provide integration of reading instruction with content area instruction.

The large number of application software titles in the database reflects several factors at work. First, in terms of marketing, there is a vast potential market for certain types of application software. For example, almost every classroom and home computer is equipped with a word processing program. Also, the use of flexible graphic programs for the desktop publishing of such items as greeting cards, banners, and signs is widespread. Software publishers realize that, even if their products gain a rather small share of the potential educational market for word processing and graphic software, they can reap significant financial rewards. As a result, many publishers offer these kinds of software. Sometimes publishers and distributors will offer a variety of competing programs. One might be inexpensively priced, for the entry-level consumers. Another might be top-of-the-line, more expensive because of

its greater capabilities. Still yet others might be designed for different grade levels. The publisher might even be listing an older, outdated program which still might be in use in some schools which have not yet become ready to pay the expense of updating their computers and software. Such software, if targeted for school-age children, is included in the database because of the tremendous use teachers and students of reading and literacy can make of the software in their classrooms and homes.

The most recent significant example of this phenomenon is the greatly increasing availability of multimedia-creation programs, designed to allow for ease in creating computer-based multimedia displays. Until a few years ago, users interested in such software had a very limited choice, perhaps HyperCard (Claris) for the Macintosh or Linkway (Eduquest/IBM) for the PC. With the increasing availability in homes, businesses, and classrooms of hardware capable of multimedia displays has come a boom in the number of such programs. Many publishers hope to establish their own software as the best-selling standard, but they know that, in an increasingly large market, even a small market share will result in profits.

Second, the tremendous flexibility of computer technology has resulted in the development of many different kinds of application software. Some kinds are very well-known, such as word processing,

database, spreadsheet, graphics utility, and desktop publishing software. Others are specific to the use of teachers, such as Spelling Tests and Puzzles (MECC), a utility program that helps teachers create spelling exercises or Electronic Portfolio (Scholastic), which is used to create computer-based portfolio assessment systems. For children, Edmark's "Destination" series allows creation of multimedia displays on specific topics, one per program: Oceans, the rain forest, pyramids, neighborhoods, and castles.

Third, different levels of computer sophistication and literacy development on the part of users will be able to take advantage of different levels of program sophistication. Learning Company's Children's Writing and Publishing Center, a desktop publishing program for creation of classroom newspapers, was very successful in its original version for the Apple II series computer. More recently, this older program has been joined by a series of software at various levels of sophistication, designed for newer hardware. Read, Write & Type! is designed for grades one and two, the Ultimate Writing & Creativity Center is designed for grades 2-5, and the Student Writing Center is for grades 5-12. The Student Writing and Research Center, a combination CD-ROM package of Student Writing Center and Compton's Concise Encyclopedia, is also available, as is The Bilingual Writing Center for bilingual Spanish and English classrooms. The Writing Center is also available for older

Macintosh models with only one megabyte RAM.

A fourth reason for the large number of application programs also has to do with marketing policies. Publishers often take the marketing path of offering basic versions of their application software at relatively low prices. If users like their purchase, they are then willing to come back to the publisher to pay for add-ons. The Print Shop (Broderbund), one of the most popular graphics utilities, can be purchased at a moderate price. By the time one buys all the available disks containing additional graphics, however, the total price is much more substantial.

A fifth reason has to do with competition in the marketplace and resulting software updates. Any publisher with a piece of application software which has an established position in the marketplace will find it necessary to constantly update and upgrade its software in order to face challenges from competitors who will attempt to publish new, superior products in order to attract customers. This process of upgrading also provides additional sales, as users of the older versions purchase the new versions in order to take advantage of the improvements.

The small number of tutorials may reflect two factors. One, effective and motivating tutorials are notoriously more difficult to design than drill and practice software. Many of the existing tutorials are little more than textbook-like pages of explanations transferred to the computer screen, with minimal interactivity. Second, research from the

early days of computer-based instruction to the present confirmed the superiority of human instruction to computerized technology in the initial teaching of skills and concepts. Keyboarding tutorials are readily available on the market, for example. 10 of the 83 tutorials in the database were for the teaching of keyboarding. But one would be hard-pressed to find many examples of students who have been successfully taught touch-typing by such software.

Like electronic books, the number of CD-ROM-based reference software available on the market has greatly increased in the past few years. Also like electronic books, much of that software is for adults, and much that is designed for children fits more neatly into content area classifications than into the classification of "reading/literacy" software. There is, however, no doubt but that greatly expanding availability of reference software can enrich integrated, literacy-rich thematic units on wide varieties of topics.

Computer-using teachers familiar with the popular Broderbund series of multiple activity software may be surprised by a closer examination of the 51 titles in this classification in the database. Broderbund has very successfully marketed an early series of software, including The Playroom and The Backyard, which offered several major components on differing topics and with differing formats and purpose. A more recent series by Edmark which focuses on one content/skill area per

program, including Bailey's Book House and Sammy's Science House, also offers a variety of activities in each program. In Bailey, for example, children can read a choose-your-own ending story and print out a copy of the results. They can also be drilled on sight word vocabulary. The multiple activity format is especially appealing to the large home market for educational software, for parents see that they are getting a variety of activities for a variety of age levels, for the price of one piece of software. Schools may be satisfied, or even prefer, software that focuses on a single skill at a single achievement level, because such software can be put to good use with large groups of students rotating in to use it. Parents, however, with very limited numbers of children to use the software, prefer the multiple format because it will provide a variety of activities, thus maintaining the children's motivation and attention for longer periods of time (Balajthy, 1996).

In examining the list of titles in this classification, however, any such marketing trend by other publishers is not yet evident. 41 of the 51 titles classified in the multiple category are from Scholastic's dated Microzine series. This series, originally distributed by subscription like traditional print-based periodicals, is available only for the older Apple II computers. Each edition of Microzine contained several new activities, such as word puzzle games, choose-your-own-ending stories, or simple graphics utilities.

Trends for 1995

Table 1 also presents the software classifications broken down into a comparison between 1995 titles and those published in prior years. The total number of titles available from publishers included in the database is 1011. Of these, 165 were released in 1995, 16.3% of the total titles available. Since the present study did not include a calculation of the total titles available in 1994, no accurate calculation of growth in number of titles available is possible. Some titles available in 1994 may have been discontinued in 1995. It may be assumed, however, that much of the 16.3% represents true growth in the number of titles available.

Some categories showed little change from previous years in publication share in 1995. Reference titles continued at less than one percent of the publications. The multiple category dropped from 6% of titles in previous years to 1% in 1995. However, as described earlier in this article, many of the previous publications in this category were from a single, outdated series, the Microzine series. If that series were accounted for in the calculations, there would be little or no change in publication share for 1995 in the multiple category. The publication share of tutorials dropped slightly, from 9% in previous years to 5% in 1995.

Among the more interesting findings is the continued strong showing for publication of electronic books. The publication share rose from 25% in previous years to 33% in 1995. The total number of

electronic books on the market appears to have grown by about 25% during 1995. Without exact numbers for the early 1990's, it is difficult to judge the trend in this category. However, the boom in electronic book publication came about with the increased availability of CD-ROM drives in computers, and that latter increase began in the early 1990's. It is fairly safe to say that the growth from 210 titles in previous years to a new total of 265, representing 26% growth in 1995, represents an increasing rate of publication of electronic books in 1995.

The publication share for application software also grew in 1995, from 21% in previous years to 29%. This growth came about as a result of a wide variety of factors. Several popular established application packages were updated and upgraded, including HyperStudio (Roger Wagner), Kid Works 2 (Davidson), Kid Pix (Broderbund), and Storybook Weaver (MECC). Publishers continued to attempt to attract market share away from established products such as Print Shop (Broderbund), Crossword Magic (Mindscape), and The Writing Center (Learning Company) by offering new or upgraded versions of their own products, such as PrintMaster (Mindscape), Crossword Studio (Nordic Software), and Classroom Newspaper Workshop (Tom Snyder). Several new multimedia-creation programs were published, including some additions to Edmark's "Destination" series. In general, the great majority of new applications were attempts at improvement on existing kinds of software. Few

provided unique approaches or major innovations. Broderbund fielded a Family Tree Maker, which might be useful in an integrated unit on families. Toucan produced a program which allows students to easily write and illustrate comic books, Pow! Zap! Kerplunk!

For drill and practice software, the market share declined from 39% in previous years to 30% in 1995. This may be due to a the shift in teacher priorities in the late 1980's and early 1990's resulting from the impact of the Whole Language movement, with its attempt to minimize grillwork in favor of more authentic literacy experiences. This lower figure, however, still represented a significant amount of software published, 51 titles. 33 of the drill and practice titles (65%) dealt with word identification skills. 11 of those combined two or more word identification skills in the drills, almost always both sight word development and phonics drills. 15 dealt solely with letter identification and phonics skills, and the remaining 7 drilled on sight words. Only one program provided drills on spelling and one other on vocabulary. 5 drilled on grammar concepts, and 4 dealt with comprehension.

Conclusions

The present study is the first in a continuing series of reports on trends in marketing and publication of software. Further analyses in the near future will provide more detailed examinations of other aspects of the topic, developed from the database. Since the present data provide

annual information for only one year, 1995, year-by-year developments are difficult to readily and accurately identify. The data, however, do provide the basis for drawing some conclusions about this continuing saga of the impact of computer technology on the reading/literacy classroom.

First, there is an enormous amount of software available for use by teachers of reading and literacy. A wide variety of types of software provides suitable material for many different objectives and for differing philosophies of instruction.

Second, drill and practice software is substantially the largest category of software available. Large numbers of electronic books and application programs are also available.

Third, there appears to be no slowing of the publication rate of software for instruction in reading and literacy. A large number of new titles became available in 1995. If anything, the number of new titles may represent a slightly increased rate of publication in 1995 over previous years.

Fourth, in 1995, the number of new titles in the three largest categories, drill and practice, electronic books, and applications, was about the same. Much of the drill and practice software was designed to provide word recognition activities to preschool and primary grade youngsters.

Table 1. Types of Software

Type	Total		Previous Years		1995	
Tutorials	83	(8%)	75	(9%)	8	(5%)
Drill & Practice	377	(37%)	326	(39%)	51	(30%)
Electronic Books	265	(26%)	210	(25%)	55	(33%)
Application	229	(23%)	181	(21%)	48	(29%)
Reference	6	(.006%)	5	(.006%)	1	(.006%)
Multiple	51	(5%)	49	(6%)	2	(1%)

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U. S. Department of Commerce. (1994). Statistical abstracts of the United States (114th ed.). Washington, DC: U. S. Department of Commerce.

Software Publishers and Distributors

Broderbund, PO Box 6125, Novato, CA 94948-6125, 800-474-8840, 415-382-4700

Claris, Claris Corporation, 5201 Patrick Henry Dr., Santa Clara, CA 95052

Computer Curriculum Corporation, 1287 Lawrence Station Road, PO Box 3711, Sunnyvale, CA 94088-3711, 800-227-8324

Davidson & Associates, Davidson & Associates, P.O. Box 2961, Torrance, CA 90509, 800-556-6141

Discis Knowledge Research, 90 Sheppard Avenue East, 7th Floor, Toronto, Ontario, Canada M2N 3A1, 1-800-567-4321

Disney Interactive, 500 S. Buena Vista St., Burbank, CA 91505-9768, 800-688-1520

Edmark, P.O. Box 97021, Redmond, WA 98073-9721, 800-320-8380

Educational Resources, 1550 Executive Drive, PO Box 1900, Elgin, IL 60121-1900, 800-624-2926

EduQuest (An IBM Company), www.ibm.com

Edutainment Company, P. O. Box 21330, Boulder, CO 80308, 800-338-3844

Hartley (A Division of Jostens Learning Corporation), 9920 Pacific Heights Blvd., Suite 500, San Diego, CA 92121, 800-247-1380

Houghton Mifflin Educational Software Division, PO Box 683, Hanover, NH 03755, 603-448-3838

Kidsoft, 10275 N. De Anza Boulevard, Cupertino, CA 95014, 800-354-

6150

Knowledge Adventure, 1311 Grand Central Avenue, Glendale, CA 91201, 800-622-1244, http://www.adventure.com

Learning Company, 6493 Kaiser Drive, Fremont, CA 94555, 800-852-2255

MECC, 6160 Summit Drive North, Minneapolis, MN 55430-4003, 800-685-MECC

Microsoft, One Microsoft Way, Redmond, WA 98052-6399, 800-955-1837, 800-426-9400

Mindscape, 88 Rowland Way, Novato, CA 94945, 800-231-3088

Roger Wagner Publishing, 1050 Pioneer Way, Suite P, El Cajon, CA 92020, 1-800-497-3778

Scholastic New Media, 2931 East McCarty Street, Jefferson City, MO 65101, 800-724-6527

Scholastic Software Club, 2931 East McCarty Stree, P.O. Box 7500, Jefferson City, MO 65102, 800-724-2424

Sunburst/Wings for Learning 101 Castleton Street, PO Box 100, Pleasantville, NY 10570-0100, 800-321-7511

Teacher Support Software, 1035 N.W. 57th St., Gainesville, FL 32605-4486, 800-228-2871

Tom Snyder Productions, 80 Coolidge Hill Road, Watertown, MA 02172-2817, 800-342-0236